An Overview of the Western Lake Erie CEAP Project

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WLEB CEAP WebEx

May 16, 2012

Topics

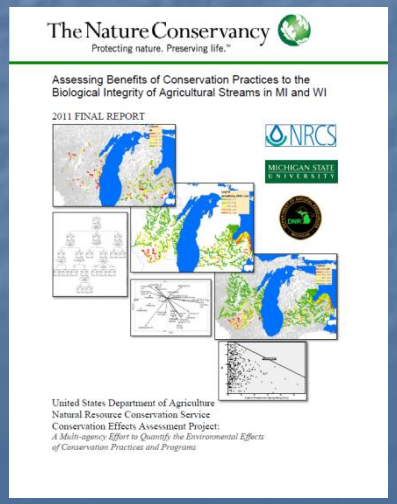
- Core Collaborators and People
- Goal and Project Area
- Objectives and Timeline
- Tasks and Roles
- Key input from and roles for partners

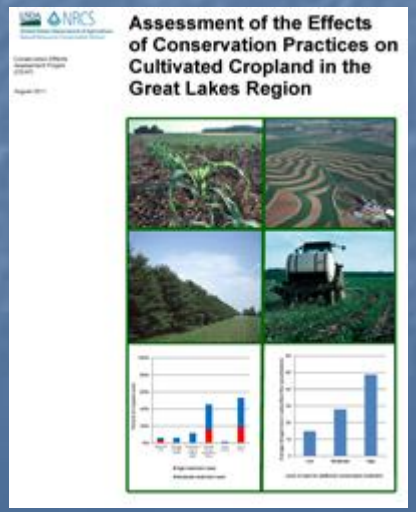
Core Collaborators and People

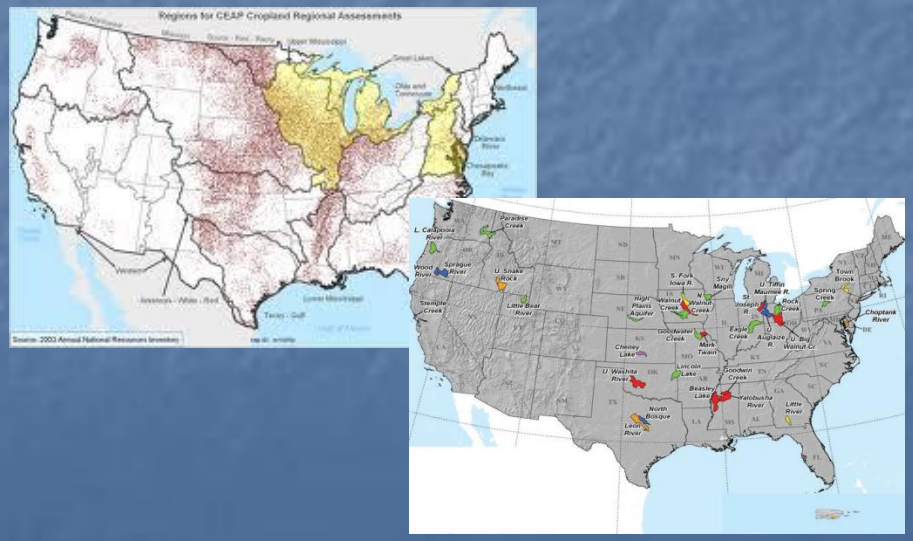
- USDA Natural Resource Conservation Service
  - Charlie Rewa, Lisa Duriancik Lee Norfleet, & Mari-Vaughn Johnson
- USDA Agricultural Research Service
  - Jeff Arnold & Mike White
- The Nature Conservancy (IN, MI, and OH)
  - Carrie Vollmer-Sanders, Scott Sowa, John Legge, Matt Herbert, Sagar Mysorekar, Bill Stanley, Anthony Sasson, & August Froehlich
- The Ohio State University and Ohio Sea Grant
  - Stuart Ludsin & Jeff Reuter

Western Lake Erie Basin CEAP Project

- GOAL: advance strategic conservation through integration of the research and modeling elements of the Wildlife Component of CEAP with the assessment and modeling elements of the Cropland Component of CEAP







Project Area

- WLEB from River Raisin to Sandusky River
- Why?
  - Priority for TNC and many others (GLRI)
  - Complex problem and testing grounds
  - Wealth of knowledge and data
  - Capacity and partnerships
  - Complimentary efforts

WLEB CEAP Objectives

- Develop and implement effective communication and collaboration strategy
- Develop a downscaled SWAT model for entire WLEB
- Develop models that predict biological endpoints based on SWAT output and other relevant variables
- Use SWAT and the companion biological models to forecast and map estimated changes in water quality, flow, and biological endpoints likely to result from a suite of conservation scenarios

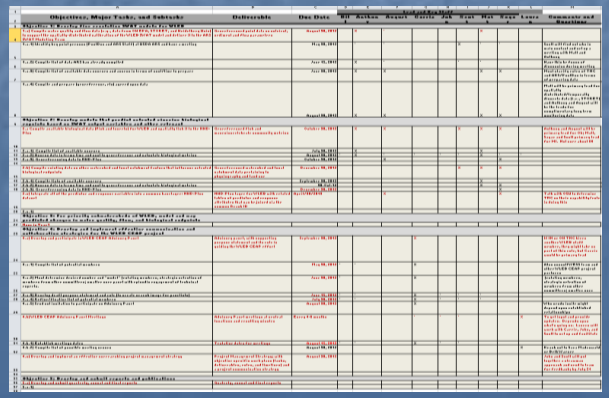
Objectives with Timeline

- Project runs from May 1, 2012 to April 30, 2015

	Year 1				Year 2				Year 3			
Objectives and Major Tasks	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Objective 1: Develop and implement communication and collaboration strategy	X	X		X		X		X		X		X
Objective 2: Develop fine resolution SWAT models for entire WLEB	X	X	X	X	X							
Objective3: Develop models that predict selected biological endpoints	X	X	X	X	X	X	X	X	X			
Objective 4: Model and map predicted changes in water quality, flow, and biological endpoints resulting from conservation scenarios in selected subwatersheds				X	X	X	X	X	X	X		
Objective 5: Develop and submit reports and publications	X	X	X	X	X	X	X	X	X	X	X	X

WLEB CEAP Objectives with Tasks and Roles

- Develop and implement effective communication and collaboration strategy
  - Establish a WLEB CEAP Advisory Panel
    - Critical input and guidance
  - Establish an Expanded National CEAP Team
    - Facilitate communication among CEAP programs
    - Facilitate expansion and improvement of approach
  - Develop and implement an overarching project management

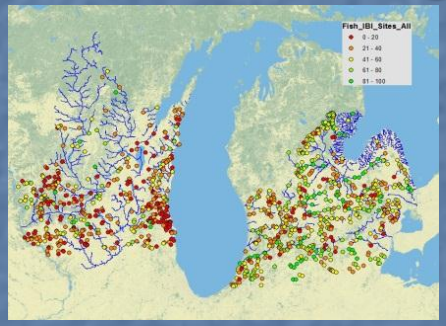


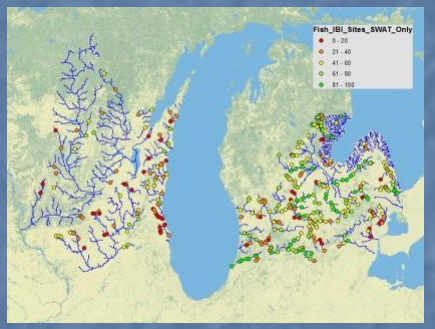
WLEB CEAP Objectives with Tasks and Roles

- Develop a downscaled SWAT model for WLEB
  - Construct a baseline SWAT simulation using NHD-Plus
  - Compile base model data to define HRUs and Subbasins
    - Streams, climate, topography, soils, land use, historic land cover, fertilizer and atrazine application rates, tillage, crop management, point sources, and subsurface tiles
  - Compile calibration and validation data
    - Streamflow – USGS Gaging stations
    - Sediment and Nutrient Loads-OH EPA and Heidelberg Univ.
    - SPARROW— Sediment, N, and P annual loads and concentrations
  - Calibrate and validate SWAT model
    - Monthly and annual at Gaged sites and broader spatial calibration
  - Use SWAT to predict historic and current water quality and flow conditions for stream reaches across WLEB

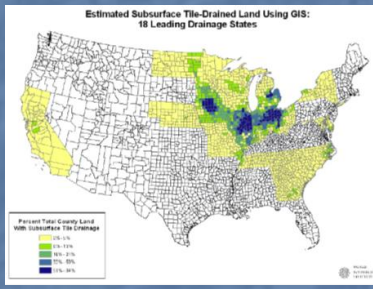
Key Points for Obj. 2

- Develop a downscaled SWAT model for WLEB
  - Construct a baseline SWAT simulation using NHD-Plus
    - Lost 75% of biological data in GL CEAP due to inability to downscale to NHD-Plus





  - Incorporate subsurface tiles
    - Tile drainage is extensive in WLEB



  - Spatially distributed calibration with discrete WQ data and SPARROW
    - Improve predictions away from Gaged sites

WLEB CEAP Objectives with Tasks and Roles

- Develop models the predict biological endpoints
  - Compile available biological data (Fish and Inverts) for WLEB and spatially link it to the NHD-Plus
    - Significantly more data than we had for GL CEAP
  - Compile existing data on other watershed and local catchment variables that influence biological endpoints
  - Integrate all of the predictor and response variables into a common baselayer: NHD-Plus dataset
  - Use multiple lines of evidence to identify ecological thresholds/ceilings for biological response variables
  - Use models to map the predicted current thresholds/ceilings of select biological metrics

WLEB CEAP Objectives with Tasks and Roles

- Use SWAT and biological models to forecast and map estimated changes in water quality, flow, and biological endpoints
  - Select 3-5 priority subwatersheds (~8 digit HUC level)
  - Select a realistic subset of 10-15 agricultural conservation practices to incorporate into conservation scenarios.
  - Develop sets of 3-5 conservation scenarios
  - Use SWAT and ecological models to predict and map changes in biological metrics associated with each conservation scenario in each priority subwatershed
  - Compare and contrast scenarios within and among the priority subwatersheds

Improving the Approach
WLEB CEAP

- Using multiple taxonomic groups as biological endpoints
- Filling other critical data gaps for predictors (tile drainage)
- Further downscaling SWAT model to minimize loss of biological data
- Incorporating spatially distributed calibration into SWAT model calibration process
- Incorporating better current land use and management data into SWAT model
- Incorporating climate change into SWAT model

Key Input and Roles for Partners

- Data for input, calibration and validation of SWAT and biological models
- Selecting 3-5 subwatersheds for Obj. 4
- Selecting conservation practices and scenarios for Obj. 4
- Sounding board for technical, logistical and social aspects of project
- Help with identifying key partners and project outreach
- Think strategically about long term integration of complimentary science, assessment, planning, and implementation efforts
- Others?

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- All WebEx participants
  - Especially the presenters